NURSE PRACTITIONERS' ADHERENCE TO PROTOCOLS

by

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ABSTRACT

In June 1980 the Nurse Practitioner Pilot Project was initiated by the Nurse Practitioner Conference Group of Utah. Sixty-two of Utah's 192 registered nurse practitioners became participants in the Pilot Project. Senate Bill 198 allowed nurse practitioners in the state of Utah to prescribe medications while practicing according to protocols in collaboration with approved physicians over a two and one-half year period. The purpose of the research was to establish whether or not nurse practitioners adhered to protocols mandated by the law.

An ex-post facto chart review of the nurse practitioner participants was done according to recorded subjective, objective, laboratory and care plan information. Data revealed that 97% of the sample was practicing at a level higher than the minimum requirements of the protocol guidelines. Demographic variables were not statistically significant in their relationship to nurse practitioners' adherence to protocols.

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ACKNOWLEDGMENTS

Many hands steer a nurse researcher to the final steps of a project such as this. Heartfelt thanks go to my committee, Suzie Tarmina, Ken Peterson and Nancy Droubay, for their unselfish donation of time already so short and for a team willingness to go the extra mile in guiding the research. Additionally, the investigation could not have been accomplished without the aid of data collector Sylvia Anderson from Brigham Young University as well as my friend, collaborator and source of limitless support, Paula Bagalio. Much appreciation also goes to JB, who learned to cook as a unique contribution to the completion of the project. Finally, the nurse practitioner participants in the study deserve recognition for their willingness to take a risk, and for their meaningful contribution to growth within the nursing profession.

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CHAPTER I

INTRODUCTION

From the inception of the nurse practitioner concept in the mid-sixties, there has been great uncertainty concerning the appropriateness of persons in this role prescribing medicines. Just as fifty years ago only physicians were allowed to measure blood pressure, diagnosis and management of health care problems by nurses has, until recently, not been considered. When Vietnam medical corpsmen returned to the United States, MEDEX programs were created with the aim of promoting and giving new orientation to the skills medics had used in military service-connected positions. Corpsmen were taught physical assessment, diagnosis and treatment to become physicians' assistants. As the nursing profession observed the beginnings of an auxiliary health care person, registered nurses who had three to four years of education in anatomy, physiology, pathophysiology, psychology and patient care, and years of clinical experience, were recognized to be as well-qualified as returning corpsmen for a similar position in the health care field. However, the concept differed because nurses were not identified

solely as assistants to physicians, and did not join the physicians assistants group. Although physicians and nurse practitioners collaborate in patient care efforts in joint practice nurses have become patient advocates, assisting the client rather than the physician in the process of identifying health needs (Brown, 1977). With a focus on primary care, the restoration and maintenance of health and an added emphasis on client education, nurses with the additional abilities to diagnose and treat clients assumed the title of nurse practitioners.

Both nurse practitioners and physicians assistants have become widely accepted by the consumer population for the treatment of minor acute illnesses and long-term management of chronic disease (Conte, 1978; Greenfield, Komaroff & Anderson, 1976; Komaroff, Black, Flatley, Knopp, Reiffen & Sherman, 1974; Komaroff, Sawayer, Flatley, & Browne, 1976; Paxton & Scoblic, 1978; Sackett, Spitzer, Gent & Roberts, 1974; Soghikian, 1978). Pharmacology courses are included in all nurse practitioner programs, not only for the purpose of understanding drug actions, reactions, interactions and side effects, as is the goal in undergraduate programs, but to provide additional information about the actual prescription of drugs for specific health problems. In spite of the fact that practitioners are educated and expected to use medications as an appropriate component of a treatment regimen, there

are few legal sanctions for such an activity. The Federal Drug Administration indicates which drugs may be used, but it is the responsibility of individual states to decide who may prescribe the drugs (Fink, 1975).

The need for legalizing the prescriptive practice of nurse practitioners in Utah became apparent when clinicians practicing in rural settings miles from a physician consultant identified the problem. Historically, licensed nurse practitioners in Utah fulfilled a client's treatment plan by signing a prescription blank initially pre-signed by a physician, signing both the physician's and nurse practitioner's names, or calling prescriptions into the pharmacist under the physician's name and with tacit approval. All of the prescribing practices were illegal unless the physician had directly consulted with the client. Yet all of the practices were performed to expedite joint practice and bring health care to underserved areas. Prescribing medications is within the scope of the practitioner's role and ability.

A subdivision of the Utah Nurses Association known as the Nurse Practitioner's Conference Group was organized to address common problems confronting the developing practitioner role in the state of Utah. Legalization of prescriptive practice was recognized as a key issue and legislative action was initiated. The Nurse Practitioner Pilot Project Act (Senate Bil 198) allowed

nurse practitioners who were practicing with physicians in the state of Utah to prescribe medications according to approved protocols for a three year period. During this time, each clinician's practice was to be evaluated and statistics gathered to substantiate the contention that nurse practitioners prescribe appropriately. A committee of three practitioners, three physicians and a pharmacist was appointed by the Governor as the supervisory body of the Pilot Project.

All nurses licensed as practitioners in the state of Utah were notified about the inception of the Pilot Project. Utah law defined a nurse practitioner as a registered nurse with further training and "added knowledge and skill gained through an organized program of study and experience" (Rules and regulations for nurse practitioners in the state of Utah, 1978). Interested nurse practitioners applied to the Governor's committee of the Pilot Project and received instructional materials, including numbered prescription pads identifying nurse practitioners in the Pilot Project. Pharmacists in the state were informed of the nurse practitioners' new privilege of prescriptive practice. Protocols were required for participation in the project, and Patient care guidelines for family nurse practitioners (Hoole, Greenberg & Pickard, 1976) was chosen as the primary guide. Nurse practitioners using different or additional

protocols than outlined by Hoole et al. (e.g., nurse-midwifery practice was not covered in the book for family practitioners) were required to formulate other protocols with the physician participant to be submitted to the Governor's committee for approval.

Purpose

The purpose of this study was to determine whether or not, under the state of Utah's presently enforced Nurse Practitioner Pilot Project Act (Senate Bill 198), nurse practitioners adhere to specified patient care protocols in a) plan of care, and b) appropriate selection and prescription of medications according to recorded signs and symptoms presented by clients. The law states that nurse practitioners who work in physician-directed settings under written protocols are permitted to write and sign prescriptions during the three-year project, which ends December, 1982.

Significance of the Research

The nurse practitioner role has been evolving for more than fifteen years. During this time, clinicians have prescribed medicines in patient management, always under the auspices of a supervising physician. Legalizing prescriptive practice would more clearly define the responsibilities of nurse practitioners, and place accountability of client management with the practitioner

prescribing the medication rather than with a physician who has had no contact with the client. The use of protocols provides guidelines and standardization of such practice in Utah. Through research of practitioners' compliance with protocols, prescriptive practice could be legalized throughout the state, leaving nurse practitioners accountable for professional actions in prescribing medications.

CHAPTER II

REVIEW OF THE LITERATURE

The evolution of an expanded role for nurses and legalization of prescriptive privileges for nurse practitioners is as new throughout the rest of the United States as it is in Utah. Consequently, there is little published documentation of prescriptive practice. This review of literature from the 1960s to present covers the use of protocols in client management, nurse's opinions concerning protocols and a discussion of prescriptive practice.

No empirical research describing the prescriptive practice used by nurse practitioners was found in the literature, however a number of writers have commented on practitioners and prescriptive practice. Siegel and Bullough (1977) noted that drug therapy was the most controversial facet of the practitioner's role and stated regulations "need further study." Others published by nursing journals such as the Nurse Practitioner addressed the selection of drugs, dosages and intervals of administration as an understood process in a plan of treatment and inherent in the role of practitioner (Kucera, 1978). Though many definitions of the practitioner role existed,

few focused specifically on the issue of prescriptive practice. Fink (1975) submitted that physician extenders should prescribe if qualified and agree to adhere to legal limits such as restrictions to specified classes of drug therapy.

Protocols and Management in Primary Care

In the early seventies, discussions of the possibility of personnel other than physicians providing primary health care by using protocols began to appear in the literature. The studies were performed primarily by physicians employed in health maintenance organizations, university ambulatory clinics or public health settings where a high volume of clients was seen and cost must be minimized while providing adequate numbers of health care personnel (Komaroff, Black, Flatley, Knopp, Reiffen & Sherman, 1974; Komaroff, Sawayer, Flatley & Browne, 1976; Greenfield, Komaroff & Anderson, 1976). Early evaluations of protocols used in practice often did not include use by nurse practitioners. Registered nurses or assistants with only high school education were originally employed in ambulatory clinics to interview clients and collect data guided by specific protocols. Using checklists to determine when to obtain further laboratory data or physician consult, trainees diagnosed and treated common illnesses such as upper respiratory and genitourinary

infections, diabetes, hypertension and headaches. Results showed that compliance with protocols, which was consistently high in the group of nurses and assistants provided "safe, effective, efficient care to clients" (Greenfield, 1976). As a result of extender personnel, physicians had more time for other responsibilities, the cost of client care was reduced and clients were satisfied with the health care received.

In research involving three nurse practitioners and 126 clients in a university clinic, Conte (1978) found that gathering and recording of a data base was well done and compliance by practitioners with protocols was high. Physician agreement with practitioners' diagnoses was 100% in cases requiring consultation. Time and cost savings were consistent with studies previously mentioned. A Kaiser Permanente group compared the management of hypertension by physicians and nurse practitioners using protocols (Soghikian, 1978). No difference was evidenced in mean diastolic blood pressure reduction. Cost per visit to a practitioner was less, but nurse practitioners saw patients more frequently. Client satisfaction was consistently high in all studies. Winickoff, Ronis, Black, Zaleznik & Komaroff (1974) had similar findings and deemed protocols a "useful and practical quality assurance tool."

One group reported audit results incongruous with

similar research of the same period. Dutton, Hoffman and Ryan (1975) found that nurse practitioners often neglected to record client histories on the clinical chart. Even after presentation of poor results of the first audit to the staff and introduction of tape recorders to ease documentation, a second review found minimal improvement in recording. Laboratory tests were used appropriately according to the protocols, but some inconsistency existed in initiating therapeutic treatment plans. No statistics or protocol samples were included in the article. After audit findings were made known, the protocols were "more appropriately" revised according to practitioner performance, client appointment-keeping and frequency of illness recurrence or reinfection. Results of a follow-up review have not been published.

Positions on Protocols

Sox, Sox and Tompkins (1973) audited patient records to evaluate physicians assistants performance by using clinical algorithms. Algorithms were defined as step-by-step instruction which included checklists for working through medical problems. Objectives of the study were to identify skills required for problem solving in a clinical setting and to formulate a means of assessing care given by physicians assistants. Trainees in this situation were expected to follow protocols precisely.

In many investigations where physicians trained assistants, no deviation from a protocol without consultation was expected (Clark & Dunn, 1976; Conte, 1978; Greenfield et al., 1976; Komaroff et al., 1974, 1976; Sox et al., 1973; Winickoff et al., 1974). The use of algorithms has been identified as "cookbook medicine", an attempt by physicians to limit the use of clinical judgment and scope of practice (Siegel & Bullough, 1977). Physicians required rigid adherence where thoroughness and reliability in the interests of safety were high priorities, usually when personnel were minimally trained in pathophysiology and had few resources for decision-making aside from a written protocol and checklist. Komaroff et al. (1974, 1976) admitted that protocols may unduly constrain users, but felt so positively about the results of training assistants with protocols that the authors questioned whether or not education should be changed from a pathophysiological orientation to a protocol-centered thought process. Roles could then be redefined according to the skills possessed rather than the educational level.

Protocols presented as positive tools in guiding client care were considered an important but not the sole part of the decision making process. Emphasis was on the algorithm format as a standard of care helpful in assessing quality (Paxton & Scoblic, 1978), facilitating decision making (West & Johnson, 1973) and a model for

clinical practice. Trandel-Korenchuk (1978) stated that protocols "imply that some procedures are standardized and protocols will give uniform response to the situation." (p. 715). Joint development of protocols by nurses and physicians stimulated interdisciplinary communication and thought process (Siegel & Bullough, 1977; West & Johnson, 1973), and aided in defining role responsibilities in the physician-nurse practitioner overlap areas. Lewis and Lewis (1976) emphasized, however, that protocols are not a substitute for professional education, and proper utilization is dependent on the skills of the user. The assurance of quality of care or the provision of adequate defense against malpractice litigation cannot be guaranteed by the use of protocols.

In a clinical study of physicians, student and graduate physician assistants, and a nurse practitioner, Grimm et al. (1975) concluded that protocols did not produce better care outcomes. Protocols could change practice behavior, however, assuring minimum standards in providers of various backgrounds. Physicians in the group thought that protocols were useful for the physician assistant providers, but not for physicians. Nonetheless, results showed changes in care, especially in recording and collecting data and also in the use of antibiotics, by all providers in the project.

Legality of Prescriptive Practice by Nurse Practitioners

Opposing factions disagreed on the issue of prescription of medications by nurse practitioners. Representing the Minnesota Medical Association, Bell (1980) argued against prescription writing by physician extenders, fearing that such practices encouraged non-physicians to seek legal authority to prescribe without physician supervision. Since physicians are trained for six to nine post-baccalaureate years, Bell's contention was that a nurse practitioner with five to six years of education cannot safely or competently prescribe medications. No statistics or practice audits were used to substantiate this stand. Clark (1976) suggested that many physicians are overtrained for the routine of daily office practice, and boredom with maintenance care and functions such as health and nutrition teaching resulted in poor delivery of care at that level.

Though caution and evaluation were recommended, the majority of published articles were positive in the treatment of new health care personnel. Concern regarding prescriptive practice more often related to legality and establishment of safe limits than with a need to establish ability to prescribe. Kucera (1978) described the history of prescribing as a physician-dominated right. Changes evolved as the practitioner movement grew,

and a 1977 revision in North Carolina laws allowed nurse practitioners and physicians assistants to prescribe after fulfilling specific requirements (Kucera, 1978). Approval came from boards of nursing and medical examiners according to rules and regulations regarding prescribing privileges, and with a supervising physician having written standing orders. In spite of the fact that the law allowed the non-physician to write medication orders, the act of prescribing was still deemed to be that of the physician. A similar situation exists in Arizona where laws allow the physicians assistant to prescribe medications, which are again issued under the name and license number of the supervising physician (Nichols, 1980). New York state presently has the most liberal laws, allowing general practice and prescription of other-than-controlled substances by physicians assistants without the constant supervision of the physician (Nichols, 1980).

The Trandel-Korenchuks (1978) defined states' legal variations, pointing out that nearly all states had made some legal attempt to address nurses' expanded role. California law delineated part of nursing function as "services for the overall well-being of the patient" including the "administration of medicines and therapeutic elements necessary for treatment." These and other facets of the nursing role are performed according to protocols and policies which serve as guidelines for care, and

provide a standardized response to a presenting problem.

Observing nursing's role expansion, Monnig (1976) commented on the issue of territoriality, and the strain created between medicine and nursing related to overlap in roles and responsibilities. This research of professional territoriality did not demonstrate conflict at that time, but the author remarked that the definition of professional identity was the key to the maintenance of boundaries. The possibility of nursing identifying with the medical profession rather than maintaining a separate entity was purported. Monnig believed that accountability for nurse practitioners will come from setting standards for care and obtaining legal standing.

In summary, protocols were identified as acceptable guidelines as standards, though controversial when required for health care delivery. Some authors felt that care management should be strictly monitored by standards of written procedures. Others insisted that protocols should not preclude the professional judgment of the clinician. States are gradually admitting that nurse practitioners have the ability to prescribe, and are identifying support. Curiously, a major goal in training new health professionals was deployment to rural areas where health care was nonexistent. The practitioner would be alone in many situations with physician consultation available only by telephone. New laws

requiring that a physician be present in a clinical practice and that all prescriptions are ultimately a physician's responsibility do not acknowledge the reality of health care delivered by a nurse practitioner in the rural setting. Neither do such laws encourage accountability of the individual professional practitioner.

CHAPTER III

THEORETICAL FRAMEWORK

In attempting to be defined and identified as a unique profession, nursing has developed and adapted theoretical bases for care. Basic to nursing education at the undergraduate level is problem solving theory. Translated into nursing process, problem solving becomes assessment or identification of a problem, formulation of a care plan, intervention and evaluation of outcomes (Schaefer, 1974). More pertinent to the study of protocol use is an extension of the problem solving process known as decision making.

Elstein (1978) defined "decision making" as the processing of information in order to make judgments. Central to the concept, therefore, is an understanding of judgment. Johnson (19755) described judgment as nonproductive thought where content is categorized or evaluated but does not directly lead to action. Newell (1968) expanded on the definition by characterizing judgment as a cognitive process, different from "searching, discovering or creating, as well as from musing, browsing or idly observing" (p. 23). The definition is one of

exclusion. Judgment is not the calculation or application of a rule, nor the passing of information. The process extends beyond given input and adds a different substance. Facts involved are available and given. Searching or formulating information is not part of the judgment process. The result is one of a set of possible responses from which selection or classification can occur.

Analysis of decision making becomes difficult in view of the conditions of uncertainty usually involved. Howard (1968) and Raiffa (1968) described qualities characteristic of decision analysis. In order to make an informed resolution, the decision maker is forced to deal specifically with data which needs to be gathered as well as timing of choices. The explicit nature requires that issues be logically dissected into indvidual parts which can be analyzed separately and then placed back into the original context. The qualitative character of decision analysis requires that the decision maker gather evidence and beliefs about the questions concerning an issue, while clearly delineating the importance placed on outcomes. A prescriptive facet suggests what should be done in a specific situation, and is consistent with a basic understanding of the problem structure, the uncertainties involved and the meaning of the outcomes.

The decision-analytic approach described by Wein-

stein and Fineberg (1980) consists of a series of four actions applicable to confronting a problem situation (Figure 1). The first step is clear identification of a) the problem and b) additional information and alternative actions in approaching the problem. Step two involves giving structure to the problem by formulating a list or categorizing information obtained in the first step. After components of the problem are clarified and arranged in a logical, time-conscious sequence, step three can be completed. At that point, the gathered information is characterized and uncertainties as well as valued outcomes can be defined. The fourth and final step may then occur: a choice can be made when the previous sequence has been followed. The authors suggested accomplishing synthesis by quantification of probabilities and sensitivity analysis, as defined as "systematically varying the different structural assumptions that are built into the decision tree (i.e., factors included or excluded) and the numerical assessments (i.e., probabilities and utilities) to see if the conclusions change" (p. 6). Although completing step four would probably result in gaining the most predictable set of outcomes, Weinstein and Fineberg (1980) admitted that the assessment of clinical problems does not necessarily have to be carried to that level of complexity. Decision-analytical thought process using steps one through three alone

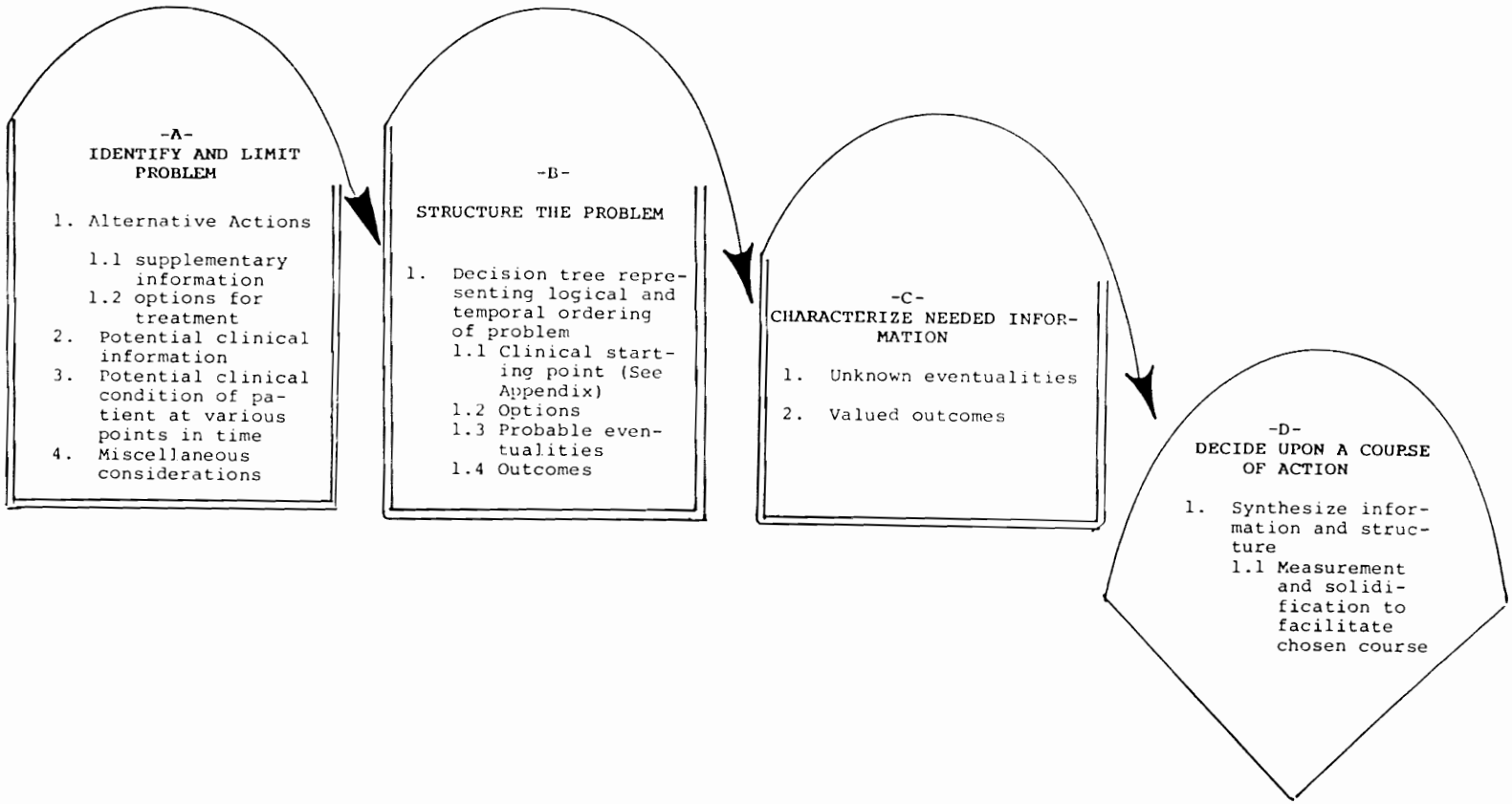

Figure 1. A clinical decision making model. (Adapted from Weinstein & Fineberg, 1980).

can be a profitable approach, with formalization (by completing step four) being required in selected cases. The theory suggests that value lies in systematically working through the structure of a problem, identifying separate components and focusing on one aspect of the greater complex issue at a time. Compromises and uncertainties can then be considered individually. The process of judgment and decision-making are then most easily discerned.

The Clinical Process Decision Model (Figure 2) provides a holistic process identifying client needs, the problem solving process and the abilities of the caregiver. Illustrated in the model are the general steps to be followed in formulating a care plan, the bases for reevaluation and the steps to be taken secondary to feedback received in assessing actions taken by the providers. Reflecting a communication network, outcomes are continuously reexamined and then re-fed into the system to be corrected.

Using the Clinical Process Decision Model to guide this study of nurse practitioners and protocols, certain elements of the decision sequence would seem to apply to areas of discrepancy in compliance. As was illustrated in the literature, critics of protocols focus on the rigidity and reflex approach required by the health care provider. Hoole et al. (1976) included alternative plans

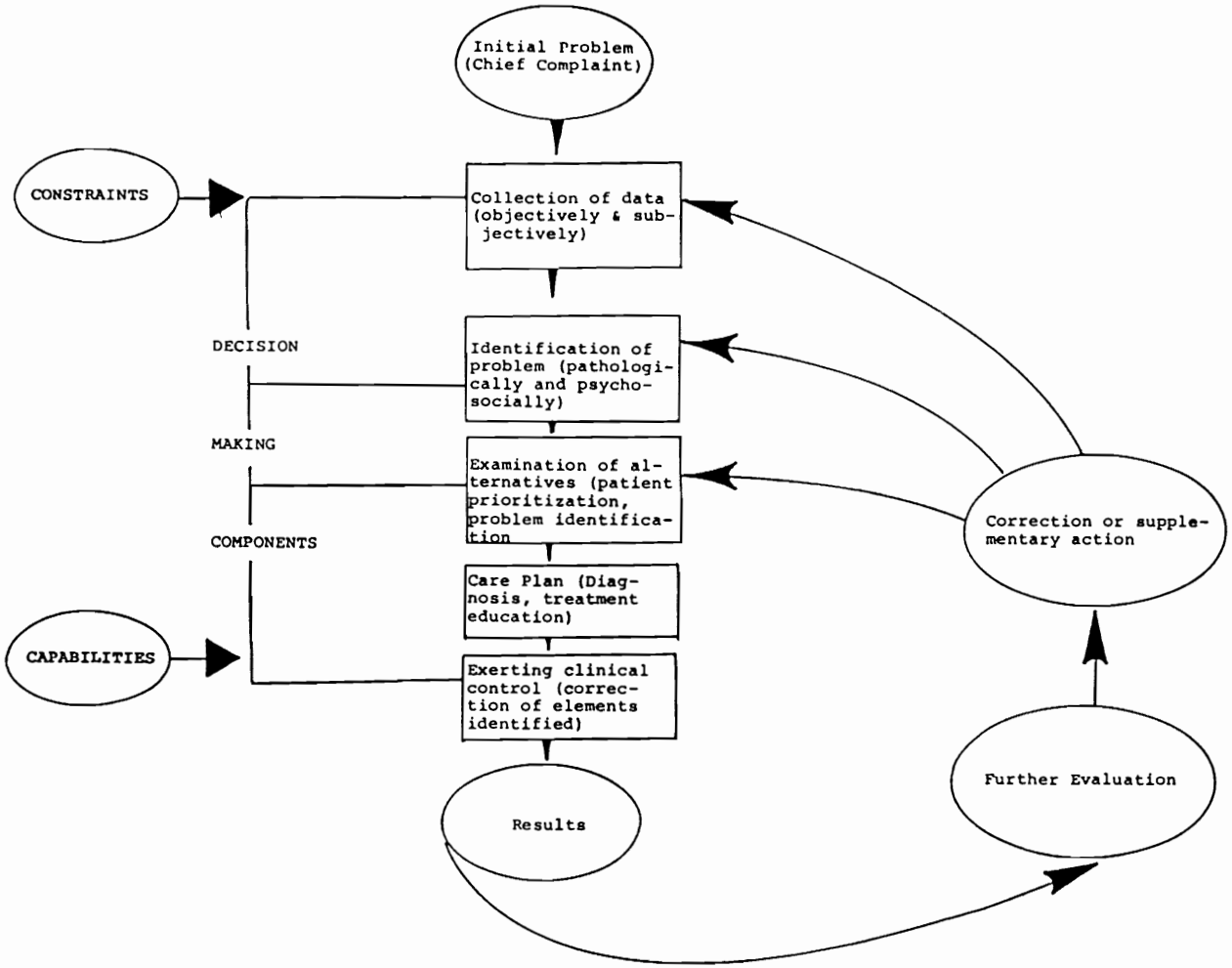

Figure 2. Clinical process decision model (Adapted from Weinstein & Fineberg, 1980 citing development of the model incorporates ideas suggested by Weed, Claus and Bailey).

in the protocol approaches, but the protocols are skeletal and meant to serve as guidelines, not being totally inclusive. Two areas in the model are junctures where a nurse practitioner might deviate from a written protocol. The first begins at the plan of care and continues through the feedback system. In formulating the plan of care, judgments are formulated, decisions are made and action is initiated. Because one clinical problem can vary widely when the total needs of an individual are considered, evaluation and feedback from the present problem or previous experiences noting successes and failures from the use of the past-prescribed protocol treatment might result in deviations at that particular point.

The section of "constraints" and "capabilities" in the model could be a second jucture relevant to the nurse practitioner. Defined by McLaughlin (1978), constraints are "those environmental or external and administrative factors which may influence the Decision Sequence" (p. 11). Constraints include money, time, limitations in services offered and written protocols, among other factors. Capabilities are "those characteristics of the practitioner which may limit or extend what he is capable of achieving in proficiency levels of practice (decision making)" (McLaughlin, 1978). Among these are age, experiences, amount of type of educational prepara-

tion, and emotional stability. Clearly, the combination of such items in each highly individual practitioner would contribute to use and perceptions concerning protocols.

In conclusion, by virtue of a background in physical and social sciences and delivery of care, and an educational philosophy which considers the total needs of individuals, nurse practitioners are capable of making clinical decisions. Practitioners have the ability to identify and analyze a problem and its parts, determine alternative actions, outline a plan and followup outcomes. Protocols can be viewed as one means of guiding the process, or as the entire process, depending on the perceptions and values given protocols by users and enforcers of protocol practice. A protocol can be considered a part of of the overall decision-making function, as in step two of the decision-analytic approach (Weinstein & Fineberg, 1980) A decision-tree was drawn to represent the logical and temporal sequences of a problem, but was not the only item required to form a judgment or make a decision. Senate Bill 198 states that nurse practitioners in the state of Utah may prescribe drugs or medicines in accordance with protocol guides. Under the law, deviations from protocols should be documented. In reality, for a practitioner seeing thirty clients per day, documentation of a rationale for treating a client with penicillin-resistant streptococcus with another antibiotic becomes

tedious when the procedure is perhaps different from the approved protocol but well within the realm of safe practice. The interpretation of the law and the decisions practitioners have made in reference to following protocols were addressed by the research questions.

Research Questions

1. To what degree are nurse practitioner participants in the Nurse Practitioner Pilot Project charting treatment plans according to approved protocols?
2. To what degree are the demographic variables (education, years of experience, prior use of protocols, number of clients seen per day) related to the charting performance?

Operational Definitions of Terms

Nurse Practitioner

A registered nurse who, by virtue of added knowledge and skill gained through an organized program of study and clinical experience recognized by the Utah State Board of Nursing has extended practice into the area of primary health care, including specialties in family care, pediatrics and midwifery is defined as a Nurse Practitioner.

Prescription

A prescription is defined as a written order for dispensing drugs.

Prescriptive Practice

Prescriptive practice is that aspect of a nurse practitioner's clinical practice which entails the ordering of medications as part of the plan of care.

Protocols

Protocols are criteria jointly developed by a nurse practitioner and participating physician for diagnosing and managing common health problems.

CHAPTER IV

METHODS AND RESEARCH DESIGN

Purpose of the Research

The Nurse Practitioner Pilot Project involves the examination of certain nurse practitioners in the state of Utah who are presently practicing and prescribing medications. The original purpose of this study was to determine fulfillment of the requirements of Senate Bill 198 by evaluating the participants' compliance in the Pilot Project. Although the project was focused primarily on the prescription of medication, this research was broader in scope because nursing practice was examined. Entire prescriptive practice, including the complete plan of care, not solely the prescription of medicines, was observed. Subjective and objective data recorded by the practitioner were gathered to support the assessment made by the nurse practitioner.

Design

The design was a descriptive study of a sample population's performance on an ex post facto analysis of a) health care treatment protocol factors, and b) demo-

graphic variables, on a set of expert-judged performance categories.

Population

The population was comprised of all registered nurses in the state of Utah who had formally applied for special licensure as nurse practitioners. To be eligible for such licensure, a registered nurse needed proof of having completed a nurse practitioner program. This included a letter of completion from a nurse practitioner certificate program or an official transcript from a degree institution. All nurses who obtained nurse practitioner licensure were invited to join the Nurse Practitioner Pilot Project. Of 192 nurse practitioners licensed to practice in Utah, 62 applied to participate in the Pilot Project before the June 30, 1981 deadline. Twenty-nine practitioners had been in the project long enough to be evaluated in the first audit in June of 1981 and constituted the convenience sample of this study (Table 1).

Due to the implications of the research results for the entire profession, and the varying qualifications and levels of preparation for the nurse practitioner role, demographic information describing the practitioner population was further explored. Descriptive data included the level of education completed at the nurse practitioner

Table 1

Population Description

	Mean	S.D.	Range
Years experience	4.9	2.8	1-12
No. of clients/ day	13.06	5.85	3.0-27.0
	N	%	
Education			
M.S.	5	18.5	
Certificate	8	29.6	
B.S.	14	51.9	
Total	27	100.0	
Prior experience with protocols			
Yes	20	69.0	
No	9	31.0	
Total	29	100.0	

level (baccalaureate, master's,certificate), the setting in which the provider was employed (urban or rural; medical center, university student health clinic or private office), average number of clients seen per day, number of physicians in the practice and frequency of contact and years of prior work experience as a nurse practitioner.

As illustrated in Table 1, of the 27 (90%) practitioners about whom demographic information was available, 8 (30%) were from continuing education-certificate programs, 14 (52%) had bachelor of science degrees and 5 (18%) were educated at the master of science level. Years of experience as nurse practitioners varied from one to twelve years. Twelve nurse practitioners were employed in a university student health setting, three in a university medical center and twelve in private offices or clinics. Twenty nurse practitioners had some previous experience with protocol use. Of the population examined, seven were family practitioners, eleven were in adult health, four nurse practitioners were certified nurse midwives and five were pediatric nurse practitioners.

Instrument

The researcher randomized chart reviews to evaluate the clinical practice of nurse practitioner participants

in the sample. Protocols for health problems frequently encountered in family nurse, adult nurse, pediatric nurse and nurse-midwifery practices were chosen by reviewing daily patient care records in the practices of each specialty. Because three data collectors obtained information, efforts were made in formulating the instrument to minimize collector bias or variability. To accomplish this, a pilot test was designed where data collectors copied a practitioner's charted entry or a selected client visit, categorizing written information under the "SOAP" format commonly used in recording: subjective (signs), objective (symptoms), assessment (diagnosis), and treatment (plan). "L" was used to identify laboratory data. This means of organizing the recording was also consistent with the publication of health care guidelines by Hoole et al. (1976). The goal of the pilot test was to compare the thought process of the data collectors and the nurse practitioner participants using the protocols, assessing similarity and omitting no data.

Minimum standards of practice were derived as baseline levels of health care recording. These standards were developed by a panel of experienced providers using Hoole et al.'s protocols as guidelines. An absolute minimum of information was established as a basic level for each charted category which had to be recorded to

justify the final diagnosis made by the nurse practitioner. If the practitioner noted the required information, a recording score of 100% was obtained. Scores greater than 100% indicate that the nurse practitioner included additional relevant historical, physical-examination or care-plan data beyond the minimum required for appropriate protocol practice.

To accomodate Lawrence Weed's (1971) widely accepted charting method, the SOAP format was used in both the collection and evaluation of the data. Each health problem was examined according to subjective-historical information recorded, objective-examination data and treatment plan of care. Laboratory data were assessed separately from the other objective parameters because laboratory procedures are essential to the assessment-diagnosis of certain health problems and needed to be more heavily weighted in the evaluation.

Reliability of the scoring system, which resulted in four procedural scores (S,O,L,P) and a sum (Total), was estimated by computing Cronbach's alpha on individual medical condition scores for the subjective recording procedure. Reliability was conputed for the subjects' first five, six, seven and eight procedures, in order. This was done to a) determine overall reliability of the scoring system, and b) recommend a number of separate health care problems which should be used for monitoring

studies of this type. Table 2 shows the reliability coefficient for each sample size. As a result of this analysis it was concluded that the reliability of the scoring system for these data was adequate (the sample had an average of 7.2 conditions). It is also recommended that future researchers or monitors address levels of responsibility and collect appropriate numbers of subjects.

Data Collection Procedure

Chart reviews were conducted during the summer and fall of 1981. Before a clinical site was assessed by the evaluation team member, the nurse practitioner participant was telephoned and a convenient time arranged. The practitioner did not have to be present for the evaluation to occur, but no charts were reviewed without the nurse practitioner's knowledge and permission. Because all information about the project evaluation had been sent in a packet at the time of participant registration, the nurse practitioners were expecting the evaluation.

As a requirement of the Pilot Project, all nurse practitioners maintained a daily record sheet (Appendix A). On the sheet was listed diagnosis and a space to indicate by checkmark whether or not a prescription had been written. Prescription pads were sequentially

Table 2

Reliability Coefficient for Four Sample Sizes in the Scoring of Reliability Procedures

Number of Conditions Used	Cronbach's Alpha
5	.562
6	.615
7	.727
8	.814

numbered and labeled "Utah Nurse Practitioner Pilot Project" (Appendix B). A carbon copy of each prescription written was retained.

To select charts randomly, all of the daily record sheets from the date of entry into the project to the date of evaluation were gathered. A date was randomly chosen, and five successive charts from five different diagnosed diseases were selected. In a family practice five charts with the diagnosis of conjunctivitis, five with pharyngitis, five with otitis, and five of each of the other conditions were obtained. If a quota of five charts could not be filled (for example, a male practitioner in a multi-speciality practice treated vaginitis infrequently), a different protocol was selected to obtain a full complement of 25 charts per practitioner. When 25 charts were selected, the visit recorded on the daily sheet was located and all information from that encounter recorded on the checklist. Medications recorded in the treatment plan were then cross-checked with the drug prescribed to verify the medication and dosage, nurse practitioner signature, format and legibility as well as sequential use of prescription forms.

To minimize bias, the graduate student data collectors obtained information in areas of Utah where each had the fewest personal affiliations. Data collecting sheets were number-coded to assure anonymity and main-

tain privacy, and results were generalized. For legal purposes, names had to be retrievable.

Statistical Analysis

Data analysis consisted of several instrument test statistics, descriptive statistics for the four procedures (subjective, S; objective, 0; laboratory, L; plan, P), total procedure score and score by conditions, and inferential analysis of procedural scores by demographic data.

Instrument test statistics were an estimate of internal reliability of the four procedure scores (S,O,L, P) added to form a total procedural score, and an estimate of internal reliability of individual procedure reporting. The purpose of the first estimate was to find the internal consistency of a composite measure of procedural performance. The purpose of the second estimate was to find a number of sample performances which could form a defensible guide for future assessments of this type.

Descriptive statistics (means, standard deviations, modes, skewness, range) of the sample were computed for each of the four procedures and the total procedure score. The purpose of the statistics was to indicate the range of performance levels which were recorded. In addition, descriptive data were computed for each health

problem to suggest levels of performance according to specific problems.

The five procedural scores were analyzed to determine the relationship between performance and demographic variables. Product-moment correlations were computed between years of experience and number of clients typically seen per day. Equality of group means was tested by a t-test for prior use of protocols as compared to prior exposure, and analysis of variance (ANOVA) for the three educational levels.

CHAPTER V

DATA ANALYSIS

In this chapter are presented the results which assess the adequacy of nurse practitioners' adherence to required protocols. The analysis reported here is threefold. First, a statistical description of how the population scored on a series of health care problems and clinical procedures is provided. Second, an analysis of individual procedural scores is made according to demographic data. The purpose of the first analysis was to determine fulfillment of the mandate of the law; the determination of whether, in fact, nurse practitioners adhere to a set of approved protocols. By assuming numerical values to charting procedures according to the relevance to the assessed problem, a total number score was applied to a provider's practice. In this way, a charting pattern was established with a range of scores by an individual practitioner as well as by various health care problems. Trends were identified. The second analysis of individual practitioners also determined fulfillment of the obligation to the Pilot Project to acknowledge the quality of practice by individual

nurse practitioner participants so that those practicing at levels below required standards could be notified and appropriate action taken. Though the sample size was small, the purpose of the third analysis was to detect any correlation between characteristics of the population and procedural scores having implications for nursing practice.

Charting Performance and Protocol Use

Table 3 presents the rating statistics by category (S, O, L, P) and total scores. As a group, nurse practitioners scored highest in recording of the objective data with a mean score of 188, although no statistically significant differences among subjective, objective and plan scores were found. However, significantly lower scores were reported for laboratory studies. The mean score of 97.6 for the laboratory procedures indicated that in 50% of the cases, nurse practitioners scored highest in the recording of the objective data with a mean score of 188, although no statistically significant differences among subjective, objective and plan scores were found. However, significantly lower scores were reported for laboratory studies. The mean score of 97.6 for the laboratory procedures indicated that in 50% of the cases, nurse practitioners were diagnosing and treating without performing the laboratory work recommended

Table 3

Sample Rating Scores by Procedure and Total

Procedure	Mean	S.D.	Median	Range	Skew-ness
Subjective	179.48	78.72	160.00	57-400 (343)	1.004
Objective	188.90	78.46	200.00	52-315 (263)	-.042
Laboratory	97.60	35.88	100.16	50-151 (101)	-.039
Plan	167.55	45.22	164.00	100-273 (173)	.424
Total	157.54	47.86	159.50	67.5-246.5 (179)	.050

Note. N=29

by the protocols. By far the widest range (343) of information charted by practitioners was evidenced in the subjective category.

Table 4 lists all of the health care problems examined. The means describe the adequacy score for a particular problem. Total scores ranged from 66 to 281, with prenatal care and seborrheic dermatitis receiving the lowest mean scores and pharyngitis the highest. Most problems were concentrated in the 100 to 174 range. The median score was 146.

A total recording score for the individual, as seen in Table 5, was achieved by averaging the sum of the mean total scores per problem evaluated by the nurse practitioner. The nurse practitioner was then given one number as an overall percentage for the quantity of recording. These ranged from 68 to 266. The median score was 157.

The range of scores illustrated the differences in recording among nurse practitioners. Individuals were relatively consistent in the styles of charting notes briefly, adequately or thoroughly. Though differences are seen from one health problem to another, each practitioner followed a pattern and style of recording.

Demographic Analysis

Pearson product-moment correlation coefficients

Table 4

Sample Rating Scores by Health Care Problem

Problem	N	Mean	S.D.	Range
1. Conjunctivitis	17	174.76	70.78	83-350
2. Vaginitis, candidal	11	129.48	28.84	82-162
3. Vaginitis, trichomonal	1	150.00	--	--
4. Vaginitis, nonspecific	6	159.38	29.51	125-200
5. Otitis media	22	172.94	74.64	61-367
6. Otitis externa	1	133.33	--	--
7. Gastroenteritis	13	145.71	26.64	83-183
8. Cystitis, adult	12	107.11	32.38	62-166
9. UTI, pediatric	3	216.66	83.23	162-312
10. Nausea, vomiting, preg.	3	112.72	5.30	106-115
11. Prenatal care	5	85.00	29.42	32-100
12. Oral contraceptive request	4	107.50	17.63	87-128
13. Follow-up BCP's	4	87.30	6.37	86-96
14. Minor sprains, strains	2	132.16	64.34	86-177
15. Atopic dermatitis	14	167.97	42.25	100-214
16. Acne	10	146-93	34.48	66-175
17. Impetigo	4	197.25	161.08	100-433
18. Contact dermatitis	5	110.86	29.44	75-137
19. Urticaria	4	194.41	57.24	127-250
20. Pityriasis Rosea	1	100.00	--	--
21. Insomnia	1	140.00	--	--
22. Seborrheic dermatitis	1	66.66	--	--
23. Herpes zoster	1	133.33	--	--
24. Scabies	1	200.00	94.28	133-266
25. Tinea pedis	1	266.66	--	--
26. Diaper dermatitis	1	137.50	--	--
27. Peptic ulcer	1	216.66	--	--
28. Atrophic vaginitis	1	108.25	--	--
Pharyngitis				
29. Cultured, rx'd +	8	239.84	154.11	50-487
30. Cultured, rx'd -	10	261.63	67.42	150-366
31. Not cultured, rx'd -	5	281.06	119.15	133-450
32. Not cultured, rx-d +	11	205.73	80.08	87-312

Table 5

Mean Scores of Nurse Practitioners by S,O,L,P and Total

NP#	S	O	L	P	Total	N
1	152	305	62	184	176	22
3	103	315	67	153	160	21
4	173	171	60	222	156	24
5	141	94	50	130	104	20
6	127	154	75	175	133	25
8	57	52	52	109	68	22
9	125	133	50	100	102	8
10	349	306	102	205	240	21
11	195	200	120	140	164	30
13	85	99	123	128	110	21
16	115	133	50	123	105	8
17	125	71	--	110	102	7
18	161	158	140	132	148	22
19	400	278	125	183	246	14
22	266	208	107	217	200	24
23	272	213	134	130	187	25
24	260	252	100	233	211	9
25	240	282	150	243	228	15
26	247	228	50	181	176	20
27	160	227	88	188	166	24
28	193	173	50	213	157	25
29	196	204	151	162	178	25
30	158	254	145	163	180	25
31	238	234	100	193	191	22
33	239	291	100	273	226	25
35	98	81	134	164	119	18
38	130	94	142	125	122	20
45	115	195	100	195	151	11
46	140	168	84	173	141	15
47	100	100	117	107	106	11

Note. -- = No lab data relating to this problem

were used to examine relationships between demographic variables previously described (years of experience, number of clients seen per day) and the rating of S,O, L,P and Total scores. Although few of the correlations were statistically significant due to a small sample size, some interesting relationships were demonstrated (Table 6).

The number of years of a nurse practitioner's work experience showed an inverse relationship to the number of laboratory tests ordered (nurse practitioners who had been practicing longer ordered fewer cultures for red throats). Subjective and plan categories were documented similarly to one another in a mildly positive correlation (S = .18; p = .21), with objective scores being slightly lower (O = .02).

There appeared to be no significant relationship between numbers of clients seen by a nurse practitioner per day and the amount of information recorded. The quantity of subjective data charted was somewhat lessened when greater numbers of clients were seen and laboratory tests continued to be recorded less than the other categories.

A t-test was used to compare the scores of nurse practitioners who had used protocols previous to the Pilot Project with those who had no experience practicing by protocols(Table 7). Though the t-values were not

Table 6

Pearson Product-Moment Correlation Coefficients: Rating Scores and Demographic Variables of Nurse Practitioners

	S	O	L	P	Total
Years Experience	.18	.02	-.34	.21	.06
p =	.17	.46	.04	.14	.37
Number of Patients/ day	-.12	.17	.04	.27	.10
p =	.26	.18	.42	.08	.30

Table 7

Demographic Analysis: Rating Scores by Prior Use

	N	Mean	T-value	DF	p
Subjective					
prior use	20	174.00	-.55	27	.58
no prior use	9	191.00			
Objective					
prior use	20	179.35	-.98	27	.34
no prior use	9	210.11			
Laboratory					
prior use	19	93.47	-.88	26	.38
no prior use	9	106.33			
Plan					
prior use	20	159.40	-1.48	27	.15
no prior use	9	185.66			
Total					
prior use	20	150.38	-1.21	27	.24
no prior use	9	173.44			

statistically significant, the mean scores of practitioners who had not used protocols in the past were higher in all four categories as well as in the total score.

In the final analysis of the data, an ANOVA test was used to determine the relationship between levels of education and scoring in the four categories. Nurse practitioners with certificates from continuing education programs had the highest mean scores in each category, followed by baccalaureate prepared practitioners, who ranked second in all categories excepting "L." In the laboratory category, baccalaureate practitioners followed masters prepared nurse practitioners. It should be noted that all of the scores except the lowest laboratory mean score of 90 were well above the minimal required score of 100%. Table 8 shows in addition that the ANOVA revealed no statistically significant differences between the groups of nurse practitioners at three levels of educational preparation.

Table 8

Demographic Analysis: Rating Scores by Education

	Education	N	Mean	S.D.		Source of Variance	SS	df	MS	F-ratio	p
S	MS	5	143.60	56.76	V[a] "S" by V Educ.[b]	Btwn groups	17453.40	2	8726.70	1.866	.18
	Certificate	7	214.12	84.70		W/in groups	112233.78	24	4676.40		
	BS	14	169.14	61.48							
	Total	27	177.74	70.62			129687.18	26			
0	MS	5	145.60	57.68	V "0" by V Educ.	Btwn groups	19205.88	2	9602.94	1.910	.17
	Certificate	8	223.75	58.68		W/in groups	120694.41	24	5028.93		
	BS	14	185.86	80.04							
	Total	27	189.63	73.35			139900.29	26			

Table 8 Continued

	Education	N	Mean	S.D.		Source of Variance	SS	df	MS	F-ratio	p
L	MS	5	100.80	36.40	V "L" by V Educ.	Btwn groups	2664.36	2	1332.18	1.024	.38
	Certificate	8	113.12	35.65		W/in groups	29925.67	23	1301.12		
	BS	13	90.00	36.20							
	Total	26	99.19	36.10			32590.04	25			
P	MS	5	143.80	38.06	V "P" by V Educ.	Btwn groups	7050.28	2	3525.14	1.86	.18
	Certificate	8	190.25	49.42		W/in groups	45365.72	24	1890.24		
	BS	14	164.57	41.58							
	Total	27	168.33	44.90			52416.00	26			

Table 8 Continued

	Education	N	Mean	S.D.		Source of Variance	SS	df	MS	F-ratio	p
T[c]	MS	5	133.45	35.54	V "T" by V Educ.	Btwn groups	9708.91	2	4854.46	2.95	.07
	Certificate	8	185.31	42.62		W/in groups	39435.62	24	1643.15		
	B.S.	14	150.78	40.82							
	Total	27	157.80	43.48			49144.54	26			

Note. [a]V = variable

[b]Educ. = Education

[c]"T" = total

CHAPTER VI

DISCUSSION OF FINDINGS

In this chapter the research questions are assessed through discussion of the relationship of the statistical analysis to actual nursing practice. Also addressed is where the information gained through this investigation fits in the current body of nurse practitioner literature.

Procedural Findings in Data Collection

Five nurse practitioners of the original sample of 33 moved from the state of Utah and therefore could not continue as members of the sample. No nurse practitionner requested to be discontinued as a participant. Due to the nature of certain employment positions, some nurse practitioners (school of nursing instructors) saw few patients and wrote too few prescriptions to have adequate data for statistical evaluation.

The originally proposed collection procedure of directly copying a charted visit as written was too time-consuming to be feasible. Some practitioners recorded more than others, especially those using

dictaphones. Evaluations lasted from four to five hours per nurse practitioner. To enhance the process and record information pertaining only to the episodic visit, a checklist format was developed. A protocol was condensed from the Patient Care Guidelines book into a checklist form. Along side each sign, symptom, laboratory data and element of treatment plan recorded by the nurse practitioner, a checkmark was placed (Appendix C). This decreased writing time while obtaining all information relevant to the care plan. Eleven common problem protocols were arranged in checklist form. Although only five protocols were examined for each nurse practitioner, the areas of practice varied so greatly that each setting needed to be individualized. For example, urinary tract infections were universal to the client populations and that protocol was used in almost all practices. Prenatal nausea and vomiting, however, were seen in volume only by nurse-midwives, and therefore that protocol was pertinent only to that practice.

Charting Performance and Protocol Use

Considering the group scores for S,O,L, and P, the amount of information recorded for subjective, objective and planning information was consistent within the group. The mean scores for S,O, and P by one practitioner were within 50 points of one another in 66% of the nurse

practitioners. The lower laboratory scores could reflect: a) the extra weight given the category by separation from the other objective data, and b) the nature of the health problems chosen out of necessity because of the difficulties in obtaining a sufficient volume of charts in other problems. The wide range in the recording of subjective data provides an interesting picture of the individual styles of nurse practitioners. Some practitioners recorded very detailed histories leading to the onset of the present health problem. Others were cryptic in the transcription of complaints, but listed appropriate and necessary information. Approximately half of the practitioners in the sample dictated the charting of each client visit which was later transcribed and placed in the client's permanent record. No nurse practitioner used checklists. Whether oral recording was time-saving and therefore contributed to more thorough charting was not explored but may have been an important factor. Microfilmed records which had originally been dictated were longer than any hand-written notes. Dutton et al. found continued poor recording even after the introduction of dictaphones which refuted any improvement due to ease of charting methods in that investigation. The repeated research of that sample would be interesting, and other studies comparing quality of charting by using various methods are indicated.

Ten health care problems were originally chosen as commonly encountered diagnoses in family practice: otitis media, vaginitis, pharyngitis, conjunctivitis, dermatitis, gastroenteritis, cystitis, nausea-vomiting during pregnancy, prenatal care and request for oral contraceptives. These were divided into 31 separate categories when five contacts for each health problem became impossible to obtain in a provider's practice. For example, when a problem such as atopic dermatitis could not be found five times, other dermatologic problems such as contact dermatitis or seborrhea were evaluated.

Each health care problem was then assessed individually to determine how nurse practitioners as a group worked with the condition. During both the collection and analysis processes, some problems presented with clearer and more straightforward data than others. Conjunctivitis, for example, characteristically had a concise history directly related to specific signs and symptoms, rquired no laboratory analysis for diagnosis, and had a simple pharmacological treatment involving little controversy or possible misuse of drug therapy. Gastroenteritis, on the other hand, appeared to be more of a diagnostic dilemma, since clients appeared quite ill in many cases and practitioners were compelled to order additional laboratory tests to rule out more

serious problems. Chosen as an acute illness for which Hoole et al. (1976) suggested that no medication be ordered, many nurse practitioners prescribed anti-emetics and/or antispamodic, anti-diarrheal drugs consistent with common medical practice. Charted records of signs and symptoms often contained more than was described by the protocol. The charting of some nurse practitioners included fewer complaints. Frequently laboratory tests were ordered to rule out other health problems. The plan differed among practitioners with some using only symptomatic care and others including drug therapy. With children, the parent usually presented a behavioral and less system-specific history, which was credited as age-appropriate for scoring. Recording of objective data appeared more related to the thoroughness of the individual practitioner. For example, when a child presented with otitis media, some described the ear findings only. Other nurse practitioners showed evidence of having examined eyes, ears, nose, throat, lungs, heart and abdomen.

Pharyngitis was the health care problem seen most commonly by nurse practitioners in this sample, and was diagnosed and treated in a variety of ways within the group and within the practice of the individual nurse practitioner. Of note is the fact that pharyngitis was treated inconsistently within the medical community

which seemed to be reflected in this sample as well. The question of culturing a sore throat arose. Hoole et al. (1976) claimed that bacterial pharyngitis cannot be definitely diagnosed without a throat culture since viral infections often manifest many of the same symptoms. Experienced providers (physicians and nurses) often remarked that a specific odor to streptococcus existed, or a history consistent with strep as opposed to viral infection was present. Because a ten day course of antibiotics is a relatively benign and inexpensive treatment, and throat cultures cost from six to fifteen dollars, many providers opted to treat a pharyngitis as bacterial or viral based on clinical judgment. No research has attempted to correlate provider diagnosis with actual culture results. For the purposes of this study, the problem of pharyngitis was divided into four categories to describe specifically the basis for management. Whether nurse practitioners should be penalized for reflecting the medical community's variations in treatment of this common condition should be assessed. Other conditions requiring laboratory data (urinary tract infections, vaginitis), had more consistent compliance by the nurse practitioners.

The health problems examined varied from some of the work in the literature. In experimenting with the use of physician extenders, Soghikian (1978) limited

the study to management of hypertension. Dutton (1975) examined nurse practitioner management of urinary tract infections. Greenfield (1976) investigated registered nurses trained to evaluate headaches. Grimm et al. (1975) examined pharyngitis management. Other authors (Heagarty, Grossi & O'Brien, 1977; Sackett, Spitzer, Gent & Roberts, 1974) researched nurse practitioners in multi-specialty capacities similar to the manner with which this sample was observed with the variety of problems seen. Obviously results are more reliable from a larger problem sample size. However, since there was no control over the population of clients to be examined by nurse practitioners in this study sample, and because nurse practitioners had contact with a large variety of many health care problems rather than a concentration of a few, the sampled size was appropriate. Nurse practitioner performance was consistent with the aforementioned studies.

In maintaining the anonymity of the practitioners, little can be said evaluatively about the variations in individual scores. Innumerable demographic and personal factors affected the type of care delivered and the practitioners' recording practices. Scoring distribution appeared to be in a fairly predictable curve, with individuals in the extreme categories of both directions and the majority practicing at a level significantly

higher than was required by the minimum established standard.

Analysis of Demographic Variables and Charting Performance

Records of subjective and planning information allowed the most room for practitioner individuality, as was reflected in the numbers obtained. As a history was elicited, the nurse practitioner identified information which was extraneous, and wrote only what pertained to the chief complaint with judgment differing between individuals. In describing the plan of care, some recorded only the essential information, the drug prescribed. The nurse practitioner was educated to provide the appropriate information to every client presenting with an upper respiratory infection, use of aspirin, fluids, decongestants and a vaporizer to relieve symptoms, in addition to the prescribed medicine. Whether that client information was recorded or given is an unanswered question.

The negative correlation demonstrated between years of experience and laboratory data ordered may have indicated the practitioners' sense of increased clinical expertise. Numerous encounters with similarly related symptomatology had perhaps given the nurse practitioner a sense of confidence in the ability to diagnose straightforward problems without the added expense of

laboratory information. The objective category allowed the least room for variation. A specific, minimal physical examination must be performed in the exploration of the etiology of certain presenting symptoms. Less was unacceptable, and more than the minimum was done with the intent of ruling out other or potentially more serious problems. Recording of objective data did not appear to be related to years of experience.

The volume of clients seen by a practitioner each day did not seem to diminish the amount of information recorded in the client's chart. Because "S" is the category which allows the most recorder freedom, indications that subjective data decreased somewhat in relation to increased client numbers were logical. The number of clients given care were reported by the nurse practitioners rather than gathered and averaged by the investigator. The estimate of charts seen by the practitioner may not have accurately reflected the busiest months of the year, and randomization of the charts investigated may also have excluded a high-volume period.

Nurse practitioners who had used protocols in the past scored consistently lower in all categories, yet were safely above the minimum required score of 100% in each case. Perhaps prior use of protocols lead to protocol use acceptance and familiarity with the protocol content bred less overcharting of information with

the nurse practitioner recording only what was minimally needed. Admittedly, the differences were small enough to say that prior use made no difference in the present adherence of nurse practitioners to protocols.

If there were differences in the performance of the nurse practitioner related to the level of educational preparation for the practitioner role, it was obscured by the charting style, which statistically showed no difference between the groups. The mean scores according to educational preparation might even have been predicted from compliance of the nurse practitioner to the rules governing the Pilot Project participants. Though no formal documentation of the actions performed by the practitioner to facilitate the study were compiled (maintaining the Daily Record Sheet and prescription recording on the designated pads) some masters-prepared practitioners did not comply as well as participants from baccalaureate and certificate programs. Perhaps the tedium and repetition of the extra paperwork involved was stronger than the implications of the evaluation. On the other hand, some nurse practitioners saw ways of eliminating the duplication of energies, hoping the investigators could use other similar record sources kept by the clinic, saving time. Even the lowest scores were within an acceptable range, and the differences between groups were not statistically different.

Current literature was most involved with the justification of the nurse practitioner role and legal status, and no information distinguishing levels of nurse practitioners' educational or experiential backgrounds was available. Recording was mentioned as a major issue only by Dutton et al. (1975). Perhaps now that the role is widely established and well accepted, a more in-depth exploration of the individual nurse practitioner and factors affecting performance will be published.

CHAPTER VII

SUMMARY AND IMPLICATIONS

Summary

When the Governor's Committee was formed and the Nurse Practitioner Pilot Projected instituted, the objective was to explore nurse practitioners' ability to prescribe drugs in primary care settings. Protocols were chosen as guidelines. This researcher examined how well nurse practitioners followed the approved protocols. The chart review was an indirect measure and only one indicated that of the thirty practitioners examined, twenty-nine (96%) followed the recommended protocols as evidenced by the randomly chosen client records. Adequate subjective, objective and laboratory data were recorded forming a basis for the assessment and resulting plan of care. The drugs prescribed were usually safe and within the realm of the protocols. Patient Care Guidelines for Family Nurse Practitioners by Hoole et al. (1976) was determined to be a conservative guide. Drugs prescribed outside of protocol recommendations were invariably within the boundaries of safe and common medical practice (AMA Drug Evaluations,

1980). Though style and quality of recording varied among individuals, the overall picture was of conservative safe practice on a daily basis by nurse practitioners in the state of Utah.

The ability of nurse practitioners to identify and structure a problem, characterize needed information and choose a course of action was tested daily in clinical practice. The statistics gathered answered the questions concerning decision-making capabilities of nurses who have received additional training and education to facilitate practice at an expanded level. Values of greater than 100% indicated that the practitioner had chosen a course of action compatible with protocols as proscribed by the Pilot Project. Scores of less than 100% had two or more possible explanations: a) the nurse practitioner completed the steps of the decision analytic approach, but the preferred course of action was not the plan suggested by the protocol; b) the nurse practitioner completed the thought process and interacted appropriately with the client, but did not record sufficient information in the client's permanent record. If protocols were considered as "contraints," inhibitors in the decision-sequence of the clinical process decision model, then the first explanation might be appropriate for a group of nurse practitioners. If protocols were used as guidelines rather than required by legislation,

assessing the nurse practitioner's clinical decision approach by evaluating the plan of care might reveal instances when the nurse practitioner decided to use the protocol as suggested or to choose an alternative course of action which might be more appropriate. The practitioner's did not have freedom to choose in this circumstance, unless the situation was documented and approval for alternative action received from the Governor's committee. Positive scores indicated adherence to protocols accepted by the Nurse Practitioner Pilot Project.

The concept of decision-making therefore became relevant for a nurse practitioner at a number of possible points in clinical practice. A model of the nurse practitioner's possible choices was constructed (Figure 3). At the first point of decision, the nurse practitioner decided whether or not to consult the protocol after identifying the problem. Perhaps comfort level with certain health problems rendered consultation unnecessary, and appropriate therapy was instituted. Previous experience with the problems before the protocol practice was instituted may have allowed the nurse practitioner to feel positively about the aspect of prescriptive practice without the need to consult the protocols, especially if the nurse practitioner felt competent in practice up to the point of introduction of the Pilot Project. If

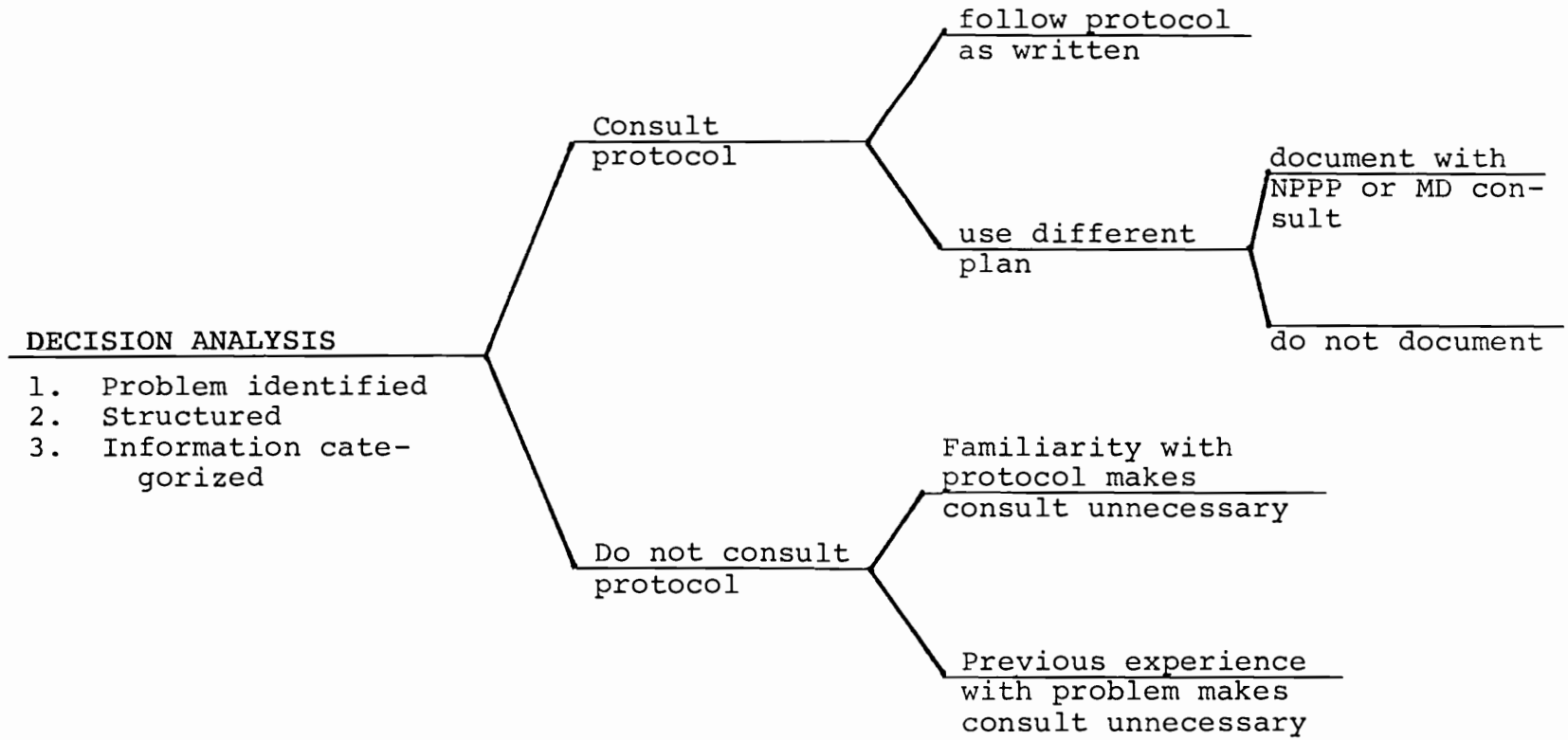

Figure 3. Nurse practitioner decision tree.

consultation of the protocol was considered time-consuming, the effort may not have been made by the nurse practitioner who was comfortable in practice.

Whatever choice was made, the decision tree illustrates the number of junctures at which a decision had to be made, and the number of directions in which a nurse practitioner could turn. This investigator believes that because of decisions made by the majority of nurse practitioner participants, the results of this study substantiate that nurse practitioners can prescribe according to protocols. Nurse practitioners obviously have and realize certain limitations. That these should be mandated by specifying a type or class of drugs (either by inclusion or exclusion) is reasonable. Whether protocols should be mandated by law will be the issue for future discussion.

Limitations of the Study

The major limitation was the reliance upon thoroughness and accuracy of recording as a measure of practice. Styles of charting information varied widely among practitioners. Tape recording, client volume, number of years in practice may have all affected the quality and quantity of documentation. As a retrospective study, no comparison of client visit and information recorded could be accomplished. Direct observation

of practitioner-client interaction would presumably have caused too great a Hawthorne effect to have been a realistic picture of practice. Chart review was the closest measure of compliance to protocols in practice.

Another factor of importance is the volunteer aspect of the sample. If 32% of nurse practitioners licensed in the state of Utah who applied to be project members, the motivation and quality of participants might differ significantly from nurse practitioners who did not apply. Results are therefore significant only to the sample.

Implications for Further Research

A variety of investigations relevant to nursing practice could develop from the Nurse Practitioner Pilot Project. Repetition of this same study by again attempting to obtain a full complement of five charts for each health care problem to assure statistical significance needs to be accomplished. As was suggested by the results of Cronbach's Alpha statistic, five charts of nine different conditions would be most reliable if money and personnel were available to perform such a detailed analysis. Another area of research could be the definition of charting styles, whether written or dictated, and possibly the introduction of a new variable such as recording checklists for specific common health care

complaints. Random assignment of checklists might elicit differences in amount and quality of information recorded. A project comparing actual clinical practice with information in the client record would reveal invaluable information correlating practice and written records.

A very simple study could be performed by asking physicians and practitioners to diagnose pharyngitis, perform throat cultures, and compare clinical impressions and laboratory results. A comparison of joint practice of the nurse practitioner and the participating physician in a practice could indicate the influence that the physician has on the nurse practitioner's provision of care. If the nurse practitioner in the practice merely reflects the physician's standards of care then peer review of physicians needs to be enforced. The body of literature which examines physician-nurse practitioner health care delivery should also be explored.

Implications for Nursing Practice

The ultimate goal in health care should be to render required services to the consumer by the safest, most effective and least expensive means possible. Each element is a basic right of the client. The responsibility for safety lies with the caregiver,

assuming that the average client has established trust in the health-care professional and does not have the knowledge base to question each aspect of therapy. Regulating safety in the form of who may deliver care is the job of state governments and organizations representing the professionals of various fields (Fink, 1975).

Opponents to protocol use say that required adherence is insulting, constricting, reduces care to a "cookbook" approach, and most vehemently assert that protocols are an attempt by physicians to restrict the nurse practitioners' scope of practice and "hamstring the legitimate use of clinical judgment" (Clark & Dunn, 1976; Siegel & Bullough, 1977). Nurse practitioners have the ability to judge and make decisions based on the combination of years of education and clinical practice.

The real issue for most nurse practitioners is not the use of protocols as guidelines but the expectation of adherence. If protocols can be employed for the positive features, as guidelines, minimum standards of care, supports (Grimm et al., 1975; Siegel & Bullough, 1977; Trandel-Korenchuk, 1978), then protocols have potential for usefulness to nurse practitioners. Documentation of thorough collection and improved recording of data with the use of protocols has been made (Conte, 1978; Grimm et al., 1975). Formulation of protocols has been cited as a positive experience between collaborating

physicians and nurse practitioners, facilitating communication and definition of roles (Siegel & Bullough, 1977; Brown, 1977). The need or indication for protocols implies that "some procedures are standardized and protocols will give uniform response to the situation" (Trandel-Korenchuk, 1978). In a partnership or a multidisciplinary practice where personal variations in styles of care as well as the fragmentation of care are issues, standards need to be established by the entire team. At the minimum, clients deserve an assurance of consistency. In that framework, protocols have potential in health care, not as instruments which preclude decision-making, but as adjuncts to the process.

Almost all states which are developing laws acknowledging the status of nurse practitioners require that they practice according to protocols (Trandel-Korenchuk, 1978). That would seem to leave room for interpretation while working within the law. Nurse practitioners can formulate a standard. Nurse practitioners are able to set a precedent for peer review, rendering it unnecessary for other professions to institute further laws or requirements for the nursing profession. By establishing measures from which outcomes can be evaluated, measuring nurse practitioners against specific criteria and standards rather than with a physicians' practice of unknown quality, the client is protected and assured of

a consistent level of care by professionals at all levels. As a result, an internalized ethic of care by use of self-imposed standards can be actualized by nurse practitioners.

APPENDIX A

DAILY RECORD SHEET

NAME	AGE	IDENTIFI-CATION NUMBER	DIAGNOSIS	Rx

APPENDIX B

PRESCRIPTION BLANK

UTAH
NURSE PRACTITIONER
PILOT PROJECT

No. 36192

Date_____

Practitioner's Name_____

Address_____ Phone No._____

Name_____

Address_____ Age_____

℞

Refills ☐ NR

Label Contents

_____ R.N.P.

Dea No._____

APPENDIX C

EXAMPLE OF DATA COLLECTION TOOL

cystitis (219) (adult)	dysuria, frequency, urgency_____ occasional gross hematuria _____ occasional low back abdominal pain. No flank or CV pain_____ no frank chills _____ no GI complaints _____ no vaginal, urethral discharge _____	temperature less than 101°F_____ only slight lower abdomen tenderness_____ no peritoneal signs_____ normal bowel sounds_____ no CV tenderness_____	urinalysis _____ urine culture _____	Antibiotics: Sufisoxazole _____ Ampicillin _____ Phenazopyridine HCL (Pyridium) _____ Increase fluids_____

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